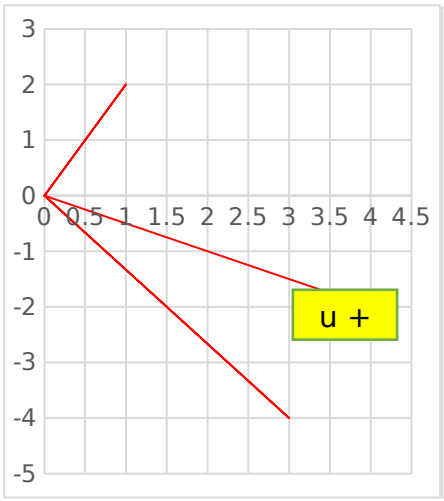
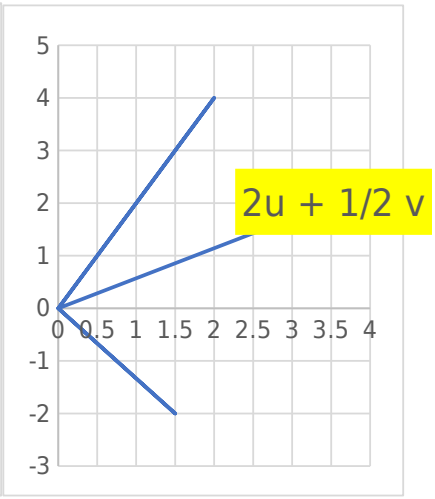
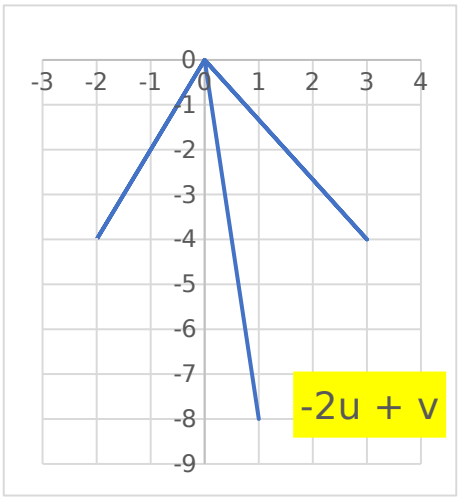
بسم الله الرحمن الرحیم

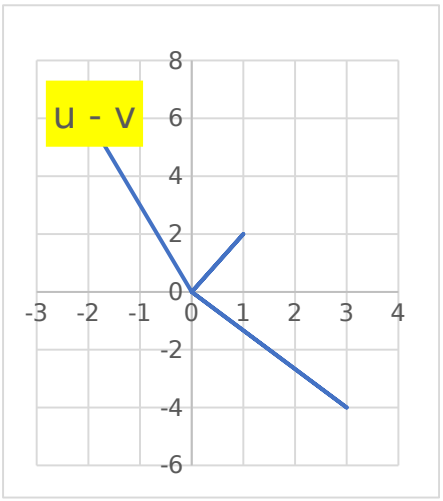
نام و نام خانوادگی : ابوالفضل نجف پور

(سوال 1









Subject .....

1) $u=(1,2)$ $v=(3,-4)$

a) $u+v=(3+1,-4+2)=(4,-2)$

b) $u-v=u+(-v)=(1-3,2+4)=(-2,6)$

c) $2u+\frac{1}{2}v=(2+1,0,4-2)=(3,0,2)$

d) $-2u+v=(-2+3,-4-4)=(1,-8)$

$(۲,۴,۶)-(۲x,۲y,۲z)-(-۲,۰,۴)=(-۲,-۴,-۶)$ 4 (2

$x=۳ \quad y=۴ \quad z=۴$

$|u|=\sqrt{۱^۲+۳^۲+۲^۲}=\sqrt{۱۴} \quad |v|=\sqrt{۳^۲+۴^۲+۱^۲}=\sqrt{۲۶}$ 5 (3

$\|u\|=\left(\frac{-۱}{\sqrt{۱۴}},\frac{۳}{\sqrt{۱۴}},\frac{۲}{\sqrt{۱۴}}\right) \quad \|v\|=\left(\frac{۳}{\sqrt{۲۶}},\frac{-۴}{\sqrt{۲۶}},\frac{۱}{\sqrt{۲۶}}\right)$

$u\cdot v=(u_۱,u_۲)(v_۱,v_۲)=u_۱v_۱+u_۲v_۲+v_۱u_۱+v_۲u_۲=$ (9

$(v_۱,v_۲)(u_۱,u_۲)=v\cdot u$

$u\cdot(v+w)=u_۱\cdot(v_۱+w_۱)+u_۲\cdot(v_۲+w_۲)+u_۳\cdot(v_۳+w_۳)$ (ب

$u_۱v_۱+u_۱w_۱+u_۲v_۲+u_۲w_۲+u_۳v_۳+u_۳w_۳$

$=u_۱v_۱+u_۲v_۲+u_۳v_۳+u_۱w_۱+u_۲w_۲+u_۳w_۳=u\cdot v+u\cdot w$

Subject ..... Date .....

ج) $k(u_1,u_2,u_3)\cdot(v_1,v_2,v_3) = (ku_1,ku_2,ku_3)\cdot$

$(v_1,v_2,w_3) = (kv_1,kv_2,kv_3)(u_1,u_2,u_3) = (ku)\cdot v =$

$(kv)\cdot u$

$v\cdot v = v_1v_1 + v_2v_2 + v_3v_3 = v_1^2 + v_2^2 + v_3^2 = |w|^2$ (ا

ب) $(v_1,v_2,v_3)\cdot(0,0,0) = (v_1\cdot 0, v_2\cdot 0, v_3\cdot 0)$

$0\cdot v = 0$

$(0,0,0) = 0$

ج) $u + ku = 0 \quad (ku_1-u_1, ku_2-u_2, ku_3-u_3) =$

$= (ku_1-ku_1, ku_2-ku_2, ku_3-ku_3) = (0,0,0) = 0$